



Installation and Troubleshooting Guide

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SIERRA P/N: 18-99217

This unit replaces P/N's: 658095, 663095, 663095-1, 663095-2, 663095-3, 663095-4, 695095, 694095, 694095-1, 694095-2, 721095, 722095, 300-888793, 300-F658095, 300-F663095, 300-F694095-2, 300-F695095, and 300-F722095.

This unit replaces CDI P/N: 176-3095

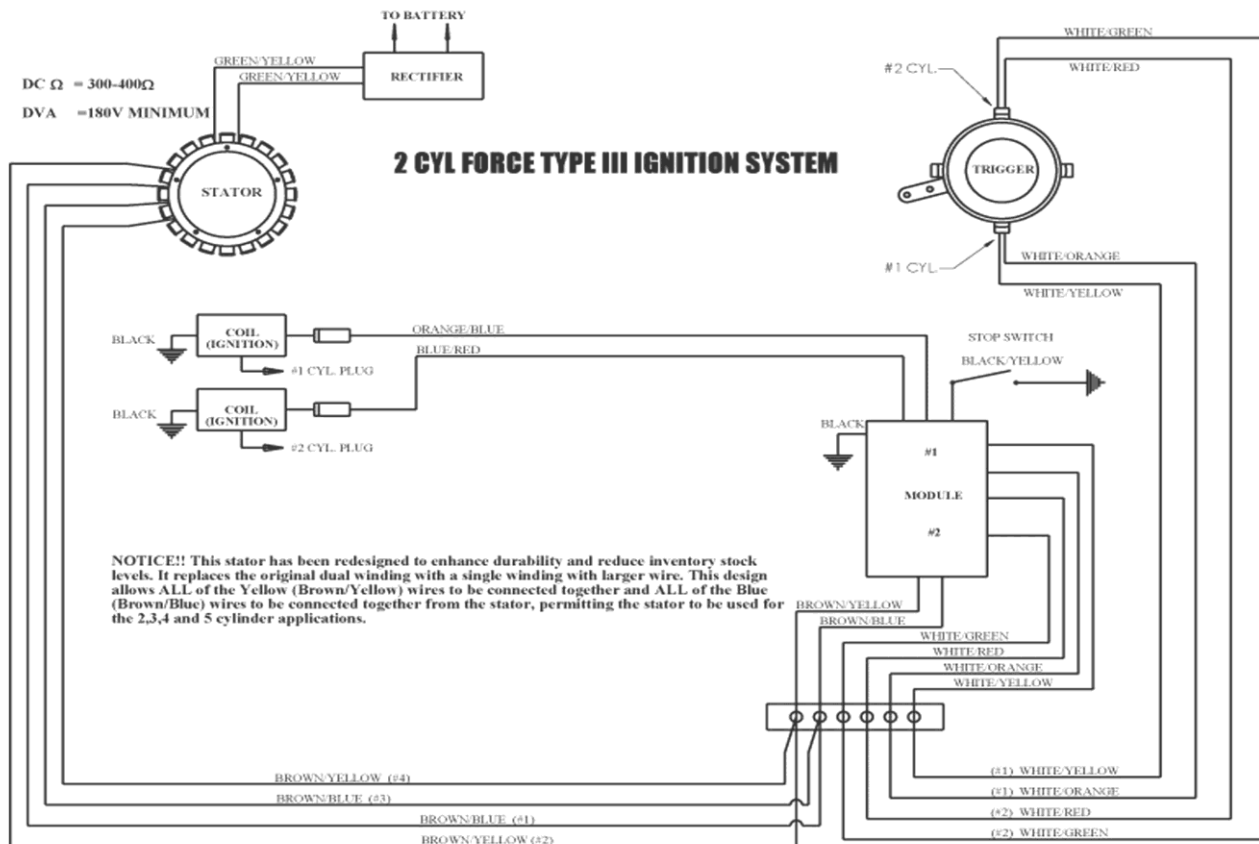
Warning! This product is designed to be installed by a professional marine mechanic. Dometic cannot be held liable for injury or damage resulting from improper installation, abuse, neglect, or misuse of this product.

This Stator has been Redesigned to enhance durability and reduce inventory stock levels. It replaces the original dual winding with a single winding with larger wire. This design allows the Stator to be used for the 2, 3, 4, and 5 cylinder applications.

INSTALLATION

2 Cylinder Using a Single Ignition Pack and Two Coils:

1. Disconnect the Negative battery cable.
2. Remove the Flywheel.
3. Disconnect the Green/Yellow Battery Charge leads from the terminal strip.
4. Disconnect the Stator's Brown/Yellow and Brown/Blue wires.
5. Remove the old Stator, saving the mounting bolts.
6. Mount the new Stator using the original mounting bolts using a high-quality thread locking compound.
7. Connect all of the Brown/Yellow wires to the Yellow wire from the Switchbox and all of the Brown/Blue wires to the Blue wire from the Switchbox.
8. Install the flywheel according to the service manual for your engine.
9. Reconnect the Negative battery cable.



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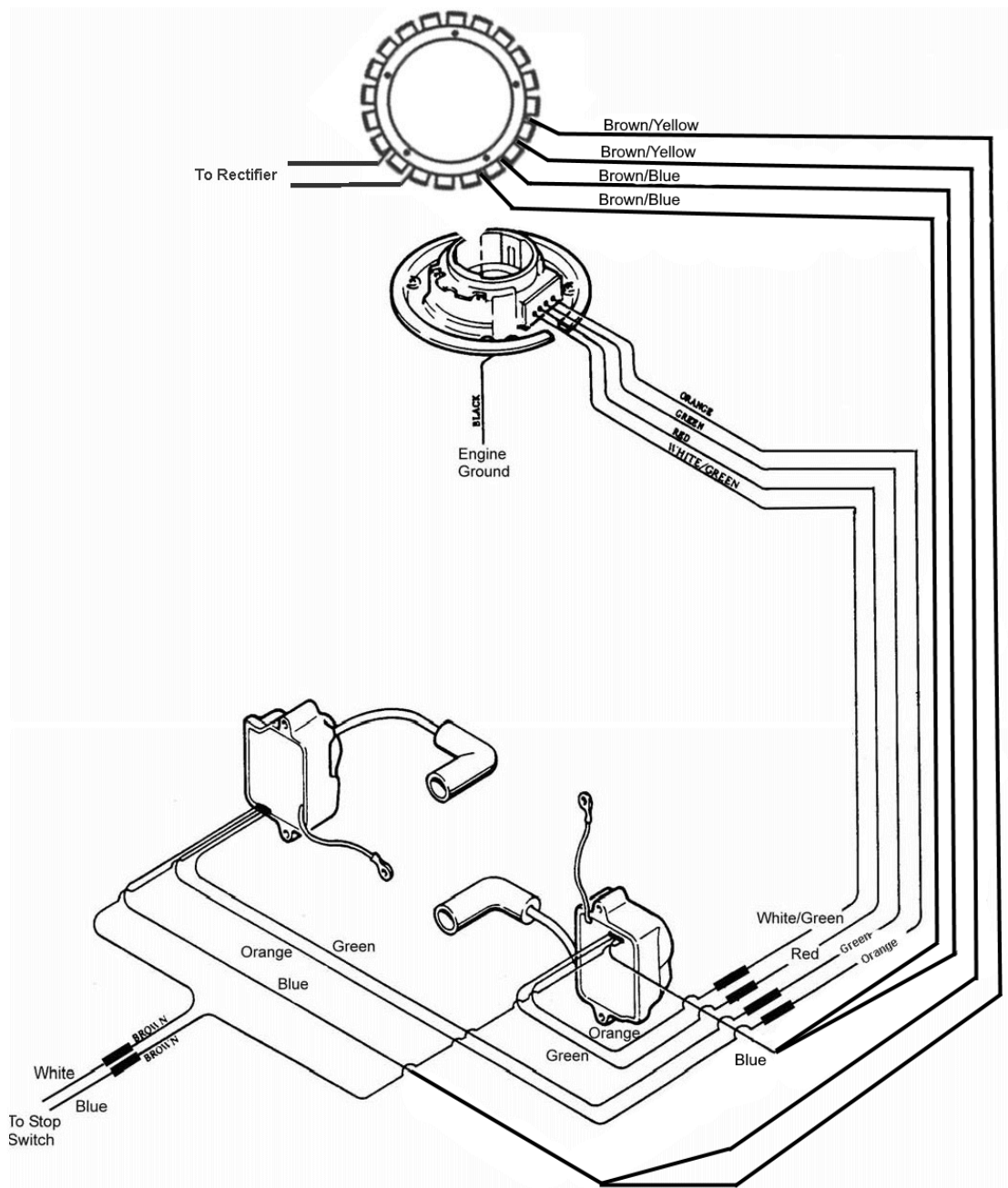


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2 Cylinder engines using combination pack and coil (2 per engine):

1. Disconnect the negative battery cable.
2. Remove the Flywheel.
3. Disconnect the Green/Yellow Battery Charge leads from the terminal strip.
4. Disconnect the Stator's Brown/Yellow and Brown/Blue wires.
5. Remove the old Stator, saving the mounting bolts.
6. Mount the new Stator using the original mounting bolts using a high quality thread locking compound.
7. Connect the Brown/Blue wires to the #1 Switchbox and the Brown/Yellow wires to the #2 Switchbox.
8. Install the flywheel according to the service manual for your engine.
9. Reconnect the Negative battery cable.



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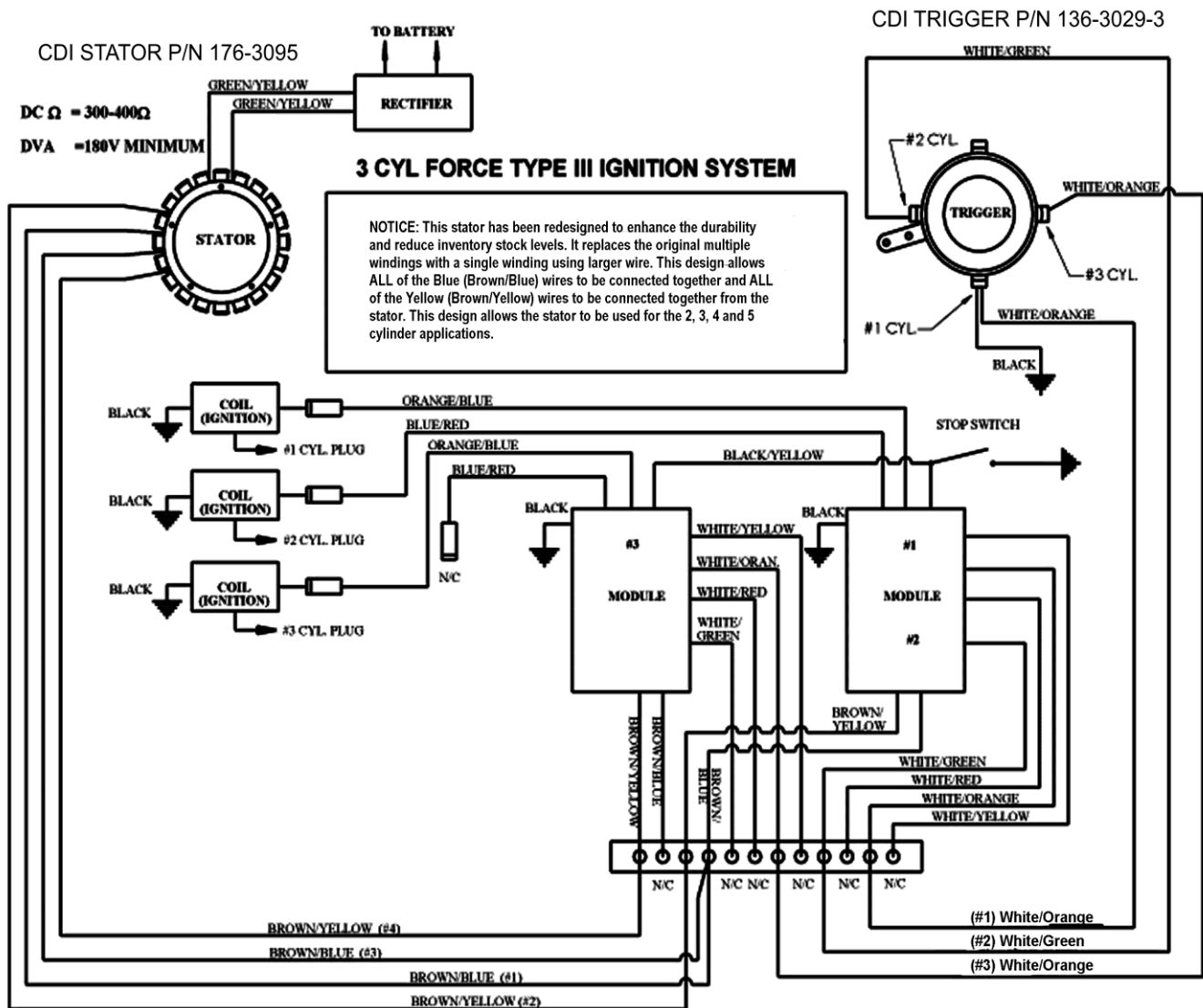
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3 Cylinder engines:

1. Disconnect the Negative battery cable.
2. Remove the Flywheel according to the service manual for your engine.
3. Disconnect the Green/Yellow Battery Charge leads from the terminal strip.
4. Disconnect the Stator's Brown/Yellow and Brown/Blue wires.
5. Remove the old Stator, saving the mounting bolts.
6. Mount the new Stator using the original mounting bolts using a high quality thread locking compound.
7. Connect both Brown/Blue wires of the new Stator to the Switchbox firing cylinders #1 and #2. Connect the Brown/Yellow wire that is labeled #2 to the Brown/Yellow wire coming out of the Switchbox that fires cylinders #1 and #2. Connect the Brown/Yellow wire labeled #4 to the Brown/Yellow wire coming out of the Switchbox that fires cylinder #3.
8. Install the flywheel according to the service manual for your engine.
9. Reconnect the Negative battery cable.

The following is a wiring diagram using a Sierra Stator and Trigger:

NOTE: 18-99217 supersedes CDI 176-3095, 18-99470 supersedes CDI 136-3029-3



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The following is a wiring diagram for a 3 cylinder engine using a Sierra Stator and an OEM Trigger:

18-99217-INST



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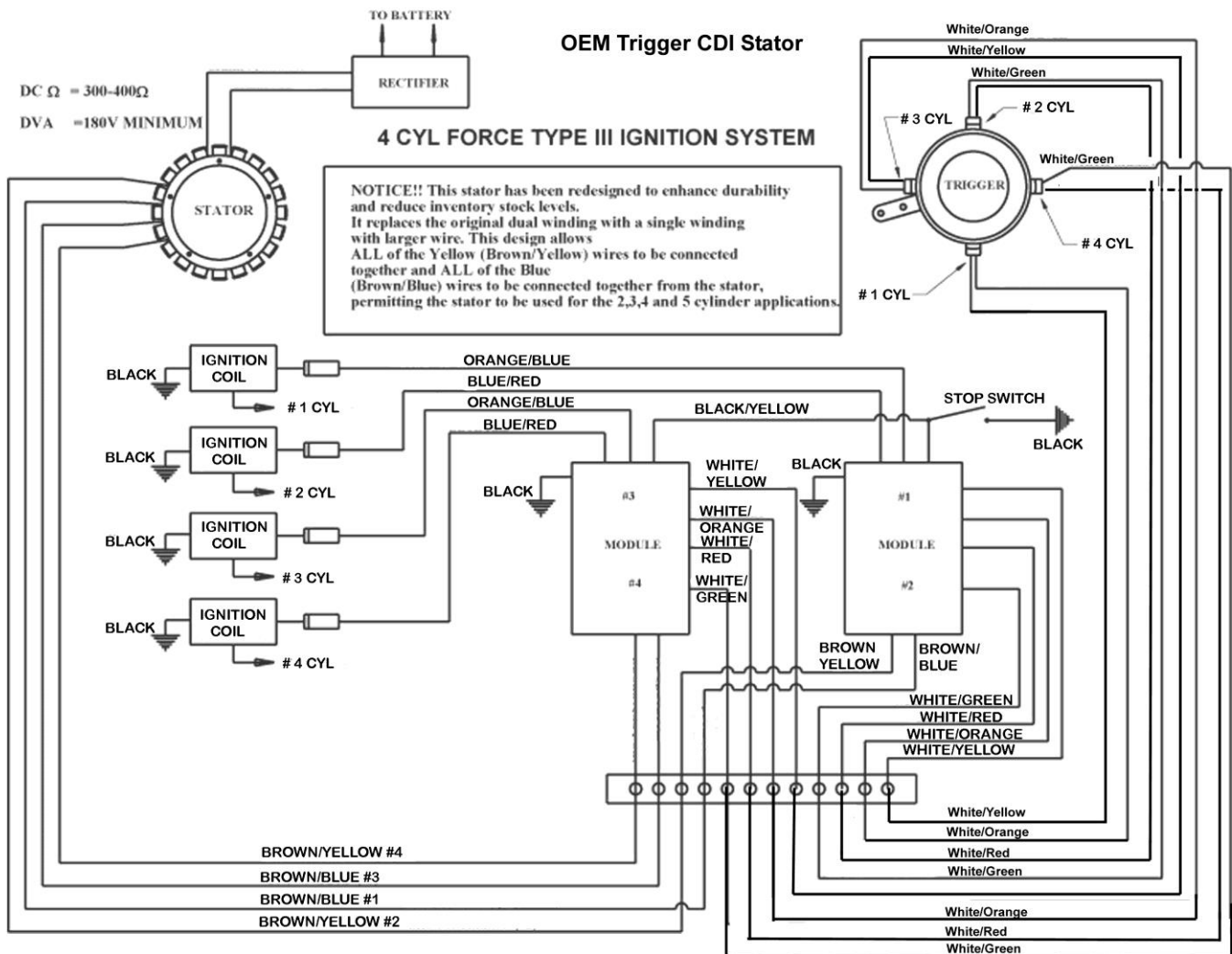
4 Cylinder engines:

1. Disconnect the Negative battery cable.
2. Remove the flywheel according to the service manual for your engines.
3. Disconnect the Green/Yellow Battery Charge leads from the terminal strip.
4. Disconnect the Stator's Brown/Yellow and Brown/Blue wires.
5. Remove the old Stator, saving the mounting bolts.
6. Mount the new Stator using the original mounting bolts using a high quality thread locking compound.
7. Connect the Brown/Blue wire labeled #1 and the Brown/Yellow wire labeled #2 to the #1 Switchbox. Connect the Brown/Blue wire labeled #3 and the Brown/Yellow wire labeled #4 to the #2 Switchbox.

Note: Some of these systems used Brown/Blue or Brown/Black/Blue for Blue and Brown/Yellow or Brown/Black/Yellow for Yellow with the factory components. Use the wiring diagram to help you install the new Sierra Stator.

8. Install the flywheel according to the service manual for your engine.
9. Reconnect the Negative battery cable.

The following is a wiring diagram for a 4 cylinder engine using a Sierra Stator and a OEM Trigger:



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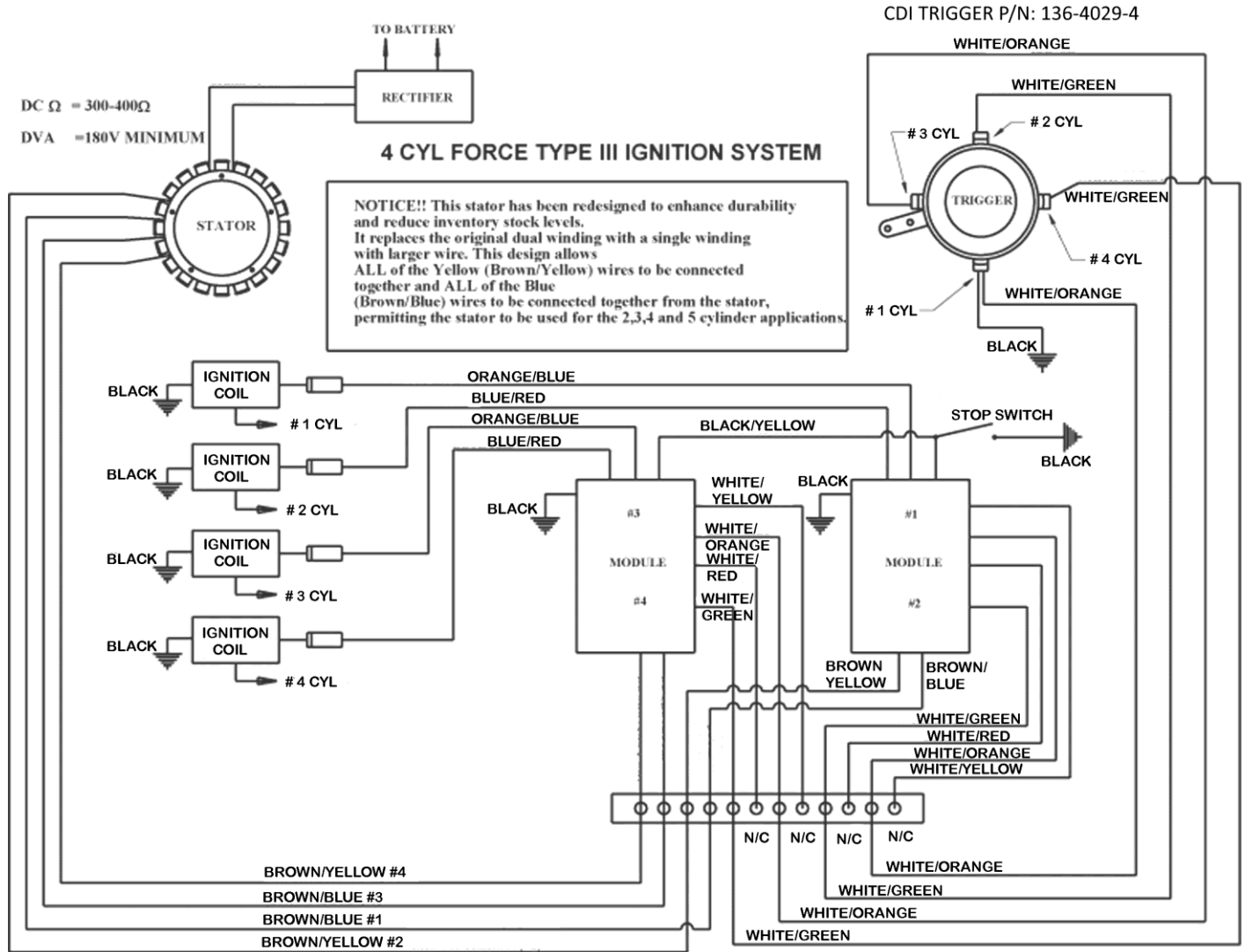


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The following is a wiring diagram for a 4 cylinder engine using a Sierra Stator and Trigger:

NOTE: 18-99467 supersedes CDI 136-4029-4



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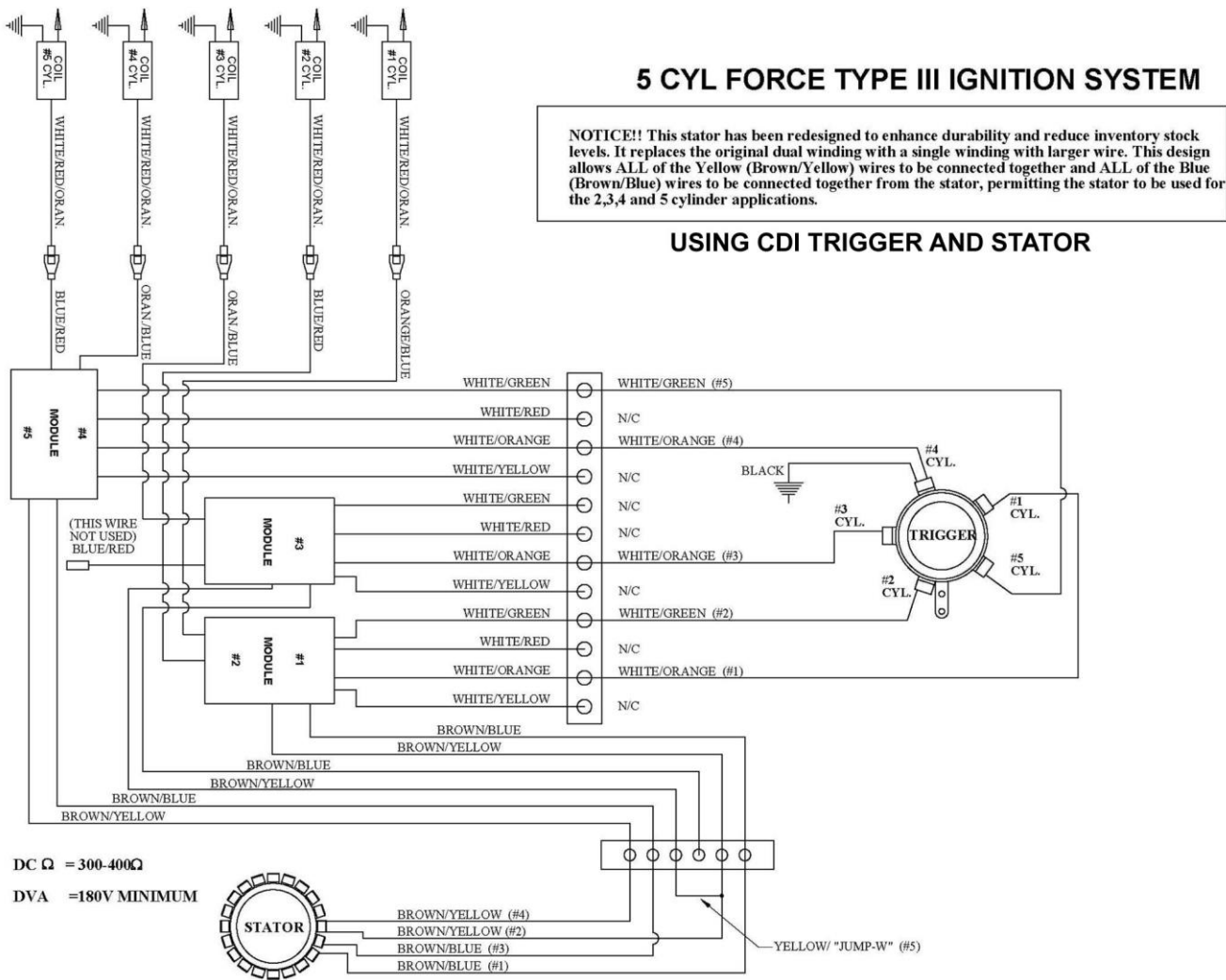
5 Cylinder engines:

1. Disconnect the Negative battery cable.
2. Remove the flywheel according to the service manual for your engines.
3. Disconnect the Green/Yellow Battery Charge leads from the terminal strip.
4. Disconnect the Stator's Brown/Yellow and Brown/Blue wires.
5. Remove the old Stator, saving the mounting bolts.
6. Mount the new Stator using the original mounting bolts using a high quality thread locking compound.
7. Connect the Brown/Blue wire labeled #1 and the Brown/Yellow labeled #2 to the Switchbox that fires cylinders #1 and #2. Install the supplied jumper wire from the #2 Brown/Yellow wire to the Brown/Yellow wire to the Switchbox that fires cylinder #3. The Brown/Blue wire for the #3 Switchbox is not to be used. Connect the Brown/Blue wire labeled #3 and the Brown/Yellow labeled #3 to the Switchbox that fires cylinders #4 and #5.

Note: Some of these systems used Brown/Blue or Brown/Black/Blue for Blue and Brown/Yellow or Brown/Black/Yellow for Yellow with the factory components. Use the wiring diagram to help you install the new Sierra Stator.

If the original Stator had a 2 pin plug on the Green/Yellow battery charge wires, remove it from the old Stator. Cut the ring terminals from the new Stator and connect the plug to the new Stator's battery charge wires.

The following is a wiring diagram for a 5 cylinder engine using a Sierra Stator and Trigger.



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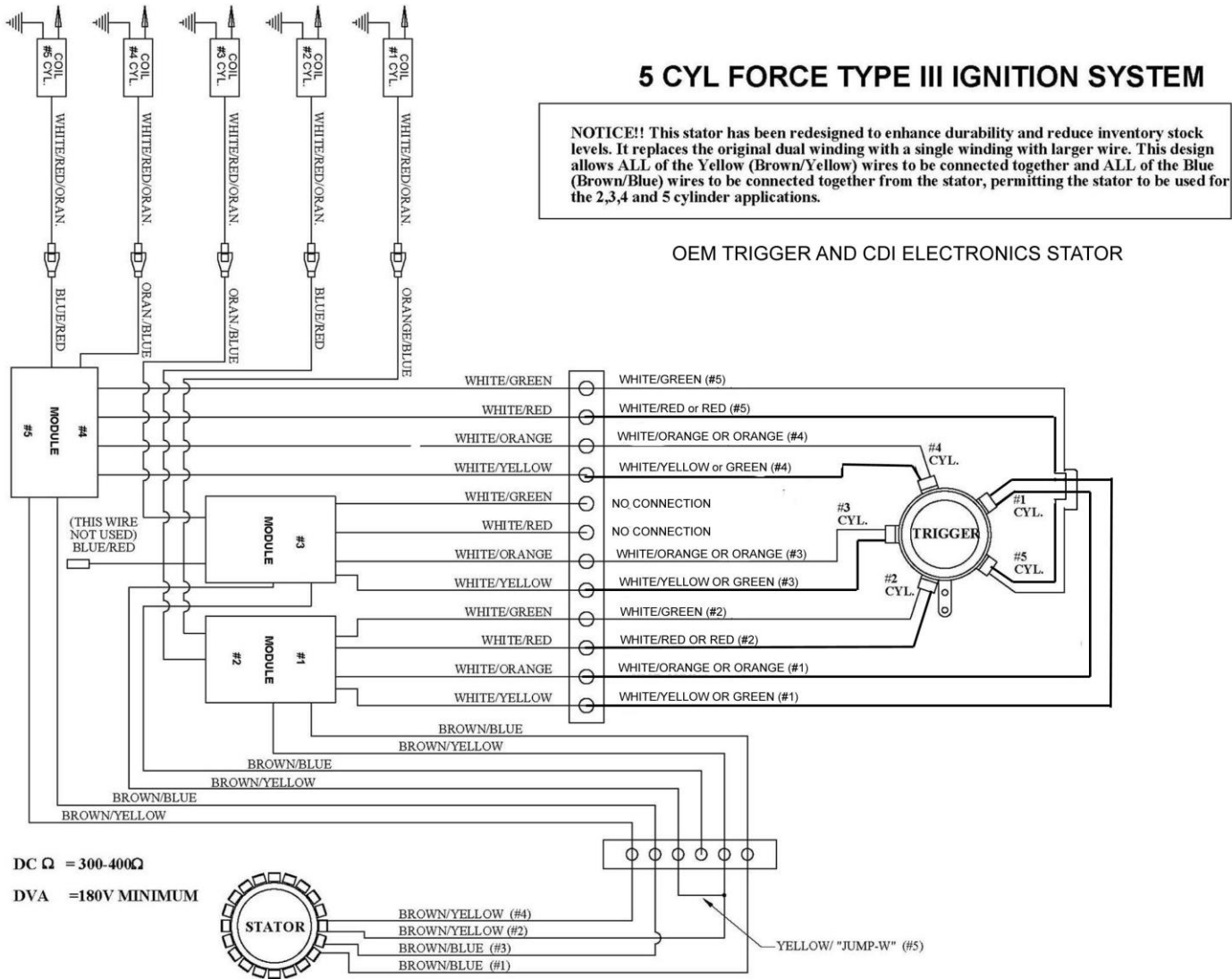
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The following is a wiring diagram for a 5 cylinder engine using a Sierra Stator and an OEM Trigger:



BROWN/YELLOW (#4)
BROWN/YELLOW (#2)
BROWN/BLUE (#3)
BROWN/BLUE (#1)

YELLOW/ "JUMP-W" (#5)



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CONNECTION GUIDE

2 Cylinder Using Combination Switchbox and Coil (2 per engine)

Switchbox #1 (Firing #1 cylinder)

Switchbox	Trigger	Stator
Orange	Orange	-
Green	Green	-
Blue	-	Brown/Yellow Stripe (2 wires)

Switchbox #2 (Firing #2 cylinder)

Switchbox	Trigger	Stator
Green	Red	-
Orange	White/Green	-
Blue	-	Brown/Blue Stripe (2 wires)

2 Cylinder engines using a single Switchbox and two coils & 3 Cylinder engines using 2 Switchboxes:

Connections from #1 Switchbox (Firing #1 and #2 Cylinders) to Trigger, Stator, and Ignition coil:

Switchbox	Trigger	Stator	Ignition coil
White/ Orange	White/Orange	-	-
White/Yellow	White/Yellow	-	-
White/Red	White/Red	-	-
White/Green	White/Green	-	-
Brown/Yellow	-	Brown/Yellow	-
Brown/Blue	-	Brown/Blue	-
Orange/Blue	-	-	White
Blue/Red	-	-	White

Connections from #2 Switchbox (Firing #3 Cylinder) to Trigger, Stator, and Ignition coil (3 Cylinder only):

Switchbox	Trigger	Stator	Ignition coil
White/ Orange	White/Orange	-	-
White/Yellow	White/Yellow*	-	-
White/Red	No Connection	-	-
White/Green	No Connection	-	-
Brown/Yellow	-	Brown/Yellow	-
Brown/Blue	No Connection (must be connected to the Blue terminal on Switchbox #1)		
Orange/Blue	-	-	White
Blue/Red	-	-	No Connection

Wire Color Code Reference:

Function	Old	New
Stator	Blue	Brown/Blue
Stator	Yellow	Brown/Yellow
Trigger	Orange	White/Orange
Trigger	Green	White/Yellow
Trigger	Red	White/Red
Trigger	White/Green	White/Green
Switchbox Primary	Orange	Orange/Blue
Switchbox Primary	Red	Blue/Red
Ignition Coil	White	Orange/Blue
Stop Circuit	White	Black/Yellow

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4 Cylinder engines using 2 Switchboxes:

Connections from #1 Switchbox (Firing #1 and #2 Cylinders) to Trigger, Stator, and Ignition coil:

Switchbox	Trigger	Stator	Ignition coil
White/ Orange	White/Orange	-	-
White/Yellow	White/Yellow*	-	-
White/Red	White/Red*	-	-
White/Green	White/Green	-	-
Brown/Yellow	-	Brown/Yellow	-
Brown/Blue	-	Brown/Blue	-
Orange/Blue	-	-	White
Blue/Red	-	-	White

Connections from #2 Switchbox (Firing #3 Cylinder and #4 cylinders) to Trigger, Stator, and Ignition coil (4 Cylinder only):

Switchbox	Trigger	Stator	Ignition coil
White/ Orange	White/Orange	-	-
White/Yellow	White/Yellow*	-	-
White/Red	White/Red*	-	-
White/Green	White/Green	-	-
Brown/Yellow	-	Brown/Yellow	-
Brown/Blue	-	Brown/Blue	-
Orange/Blue	-	-	White
Blue/Red	-	-	White

5 Cylinder engines using 3 Switchboxes:

Connections from #1 Switchbox (Firing #1 and #2 Cylinders) to Trigger, Stator, and Ignition coil:

Switchbox	Trigger	Stator	Ignition coil
White/ Orange	White/Orange	-	-
White/Yellow	White/Yellow*	-	-
White/Red	White/Red*	-	-
White/Green	White/Green	-	-
Brown/Yellow	-	Brown/Yellow	-
Brown/Blue	-	Brown/Blue	-
Orange/Blue	-	-	White
Blue/Red	-	-	White

Connections from #2 Switchbox (Firing #3 Cylinder) to Trigger, Stator, and Ignition coil:

Switchbox	Trigger	Stator	Ignition coil
White/ Orange	White/Orange	-	-
White/Yellow	White/Yellow*	-	-
White/Red	No Connection	-	-
White/Green	No Connection	-	-
Brown/Yellow	-	Brown/Yellow	-
Brown/Blue	No Connection (must be connected to the Blue terminal on Switchbox #1 or 2)		
Orange/Blue	-	-	White
Blue/Red	-	-	-

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Connections from #3 Switchbox (Firing #4 and #5 Cylinders) to Trigger, Stator, and Ignition coil:

Switchbox	Trigger	Stator	Ignition coil
White/ Orange	White/Orange	-	-
White/Yellow	White/Yellow*	-	-
White/Red	White/Red*	-	-
White/Green	White/Green	-	-
Brown/Yellow	-	Brown/Yellow	-
Brown/Blue	-	Brown/Blue	-
Orange/Blue	-	-	White
Blue/Red	-	-	White

* SIEI replacement Triggers do not have a connection for this wire from the Switchbox as the new Trigger uses a common ground wire. This allows the wires going to the Switchbox from the Trigger to be larger and more durable. The Switchbox uses that color as a ground wire for the Trigger.

TROUBLESHOOTING

2 CYLINDER TROUBLESHOOTING USING COMBINATION SWITCHBOX AND COIL:

NO SPARK OR INTERMITTENT SPARK ON ONE CYLINDER:

1. Check the Brown stop wires. They MUST be separated from each other. THIS SYSTEM SHORTS THE BROWN WIRES TOGETHER TO STOP THE ENGINE. The common practice of connecting the stop wires together and shorting them to ground in order to stop the engine will not work on this engine. Disconnect the Brown stop wires and retest. If you have spark, check the Ignition switch's "M" terminals if using remote start. You should have a White wire on one terminal and a Blue wire on the other terminal. If both the Blue and White wires are connected together, correct the wiring. If the engine has a tiller handle, check the push button stop switch.
2. Check the Stator and Trigger resistance and DVA as follows:

Read from	Read to	OEM Ohms	SIE Ohms	DVA (Connected)	DVA (Disconnected)
Blue (Stator)	Blue (Stator)	680-900 Ω	250-350 Ω	180-400 V	-
Blue (Stator)	Engine Gnd	Open	Open	-	Less than 2 V
Blue (Stator)	Engine Gnd	Open	Open	-	Less than 2 V
Orange (#1 Trigger)	Green (#1 Trigger)	45-55 Ω	45-55 Ω	0.5 V Minimum	-
Red (#2 Trigger)	White/Green (#2 Trigger)	45-55 Ω	45-55 Ω	0.5 V Minimum	-

NOTE: Some OEM Stators had Blue wires instead of the Blue and Yellow wires more commonly used.

3. If readings are good and the #2 cylinder is the one not sparking, swap the Red and White/Green Trigger wires. If both cylinders now have spark, the Trigger is not wired for this engine. However, you may leave the wires as they are and the engine will run normally.
4. Disconnect the stop wire from one Switchbox. If that cylinder starts sparking, the stop circuit in the harness or on the boat is bad, possibly the Ignition switch.
5. If readings are good, disconnect stop wire from one Switchbox. If the dead cylinder starts sparking, the problem is likely the blocking diode in the opposite Switchbox.

WILL NOT STOP (KILL):

1. Disconnect the Brown stop wires. Connect a jumper wire to ONE of the Brown (or Black/Yellow) stop wires from the Switchbox and short it to engine ground. If this stops the Switchbox from sparking, the stop circuit has a fault. Check the key switch, harness, and shift switch. If this does not stop the Switchbox from sparking, replace the Switchbox.

2 CYLINDER TROUBLESHOOTING USING SEPARATE SWITCHBOX AND IGNITION COILS:

NO SPARK ON ANY CYLINDER:

1. Disconnect the White or Black/Yellow stop wire AT THE SWITCHBOX.
2. Disconnect the Brown (or Black/Yellow) stop wires from the Switchbox. Measure DC voltage from the stop wires (from the harness) to engine ground. Turn the Ignition switch on and off several times. DC voltage should never exceed 2 VDC. If it does, the stop circuit has a fault. Check the key switch, harness, and shift switch. Potential damage to the switchbox's kill circuit may occur with more than 2 VDC on the kill wires.
3. Disconnect the Rectifier. If the spark returns, replace the Rectifier.
4. Check for broken or bare wires on the Switchbox, Stator, and Trigger. Check for broken wires and terminals, especially inside the plastic plug-in connectors.

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5. Check the Stator and Trigger resistance and DVA as follows:

Read from	Read to	OEM Ohms	SIE Ohms	DVA (Connected)	DVA (Disconnected)
Blue (Stator)	Yellow (Stator)	680-900 Ω	250-350 Ω	180-400 V	-
Blue (Stator)	Engine Gnd	Open	Open	-	Less than 2 V
Yellow (Stator)	Engine Gnd	Open	Open	-	Less than 2 V
Orange (#1 Trigger)	Green (#1 Trigger)	45-55 Ω	45-55 Ω	0.5 V Minimum	-
Red (#2 Trigger)	White/Green (#2 Trigger)	45-55 Ω	45-55 Ω	0.5 V Minimum	-

NOTE: Remember that the Stator may use Brown/Yellow or Brown/Black/Yellow for Yellow and Brown/Blue or Brown/Black/Blue for Blue.

NO SPARK OR INTERMITTENT SPARK ON ONE CYLINDER:

1. Check the Stator and Trigger resistance and DVA as follows:

Read from	Read to	OEM Ohms	SIE Ohms	DVA (Connected)	DVA (Disconnected)
Blue (Stator)	Yellow (Stator)	680-900 Ω	250-350 Ω	180-400 V	-
Blue (Stator)	Engine Gnd	Open	Open	-	Less than 2 V
Yellow (Stator)	Engine Gnd	Open	Open	-	Less than 2 V
Orange (#1 Trigger)	Green (#1 Trigger)	45-55 Ω	45-55 Ω	0.5 V Minimum	-
Red (#2 Trigger)	White/Green (#2 Trigger)	45-55 Ω	45-55 Ω	0.5 V Minimum	-

NOTE: Remember that the Stator may use Brown/Yellow or Brown/Black/Yellow for Yellow and Brown/Blue or Brown/Black/Blue for Blue.

2. If the readings are good, disconnect stop wire from one Switchbox. If the dead cylinder starts sparking, the problem is likely the blocking diode in the opposite Switchbox.

SWITCHBOX OR TRIGGER REPEATEDLY BLOWS ON SAME CYLINDER:

1. Check the Trigger wires for shorts to engine ground as a shorted Trigger wire can destroy a SCR inside the Switchbox.
2. In contrast, a shorted SCR inside the Switchbox can destroy a Trigger coil. Check the Trigger resistance and DVA (see **NO SPARK ON ANY CYLINDER**).
3. Replace the Ignition coil on the cylinder dropping spark.

NO SPARK ON TWO CYLINDERS:

1. If two cylinders from the same Switchbox will not spark, the problem is usually in the Stator. Test per above.
2. If the engine has a CDI Stator installed and if #1 and #3 are the cylinders not sparking, disconnect the Yellow Stator wire from the # 1 Switchbox and see if the #3 cylinder starts sparking. If so, replace the #1 Switchbox. If not, then reconnect the Yellow Stator wire to the # 1 Switchbox and disconnect the Yellow Stator wire from the # 2 Switchbox and see if the #1 cylinder starts sparking. If so, replace the # 2 Switchbox. If #2 and #4 are the ones not sparking, disconnect the Blue Stator wire from the # 1 Switchbox and see if the #4 cylinder starts sparking. If so, replace the #1 Switchbox. If not, then reconnect the Blue Stator wire to the # 1 Switchbox and disconnect the Blue Stator wire from the # 2 Switchbox and see if the #2 cylinder starts sparking. If so, replace the # 2 Switchbox.

WILL NOT STOP (KILL):

1. Disconnect all (White or Black/Yellow) stop wires at the Switchbox. Connect a jumper wire to the stop wire from the Switchbox and short it to engine ground. If this stops the Ignition coil from sparking, the stop circuit has a fault. Check the key switch, harness, and shift switch. If this does not stop the Ignition coil from sparking, replace the Switchbox. Repeat test as necessary for additional Switchboxes.

COILS ONLY HAVE SPARK WITH SPARK PLUGS OUT:

1. Check for dragging starter or low battery causing slow cranking speed. DVA test Stator and Trigger.

MISS AT ANY RPM:

1. Disconnect the Rectifier from the Stator and retest. If the miss clears, replace the Rectifier.
2. In the water or on a Dynamometer, check the DVA from Switchbox while connected to the Ignition coils. You should have a reading of at least 150 V or more, increasing with engine RPM until it reaches 300-400 V maximum. A sharp drop in DVA right before the miss becomes apparent on all cylinders will normally be caused by a bad Stator. A sharp drop in DVA on less than all cylinders will normally be the Switchbox or Trigger.
3. Connect an inductive tachometer to each cylinder in turn and try to isolate the problem. A high variance in RPM on one cylinder usually indicates a problem in the Switchbox or Ignition coil. Occasionally a Trigger will cause this same problem. Check the Trigger DVA (see **NO SPARK ON ANY CYLINDER**).

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4. Perform a high-speed shutdown and read the spark plugs. Check for water. A crack in the block can cause a miss at high speed when the water pressure gets high, but a normal shutdown will mask the problem.
5. Check the Triggering and charge coil flywheel magnets for cracked, broken and loose magnets.

3 AND 4 CYLINDER ENGINES:

NO SPARK ON ANY CYLINDER:

1. Disconnect the (White or Black/Yellow) stop wire AT THE SWITCHBOX. If spark comes back, touch the White kill wires together and check for spark. If no spark, replace the Switchboxes. If you still have spark with the White wires touching together, there is a problem in the harness, key switch, or the other Ignition Switchbox.
2. Disconnect the Rectifier. If the engine now has spark, replace the Rectifier.
3. Check for broken or bare wires on the Stator and Trigger.
4. Check the Stator and Trigger resistance and DVA as follows:

Read from	Read to	OEM Ohms	SIE Ohms	DVA (Connected)	DVA (Disconnected)
Brown/Blue (Stator)	Brown/Yellow (Stator)	680-900 Ω	250-350 Ω	180-400 V	-
Brown/Blue (Stator)	Engine Gnd	Open	Open	-	Less than 2 V
Brown/Yellow (Stator)	Engine Gnd	Open	Open	-	Less than 2 V
White/Orange (#1 Trigger)	White/Yellow (#1 Trigger)	45-55 Ω	45-55 Ω	0.5 V Minimum	-
White/Red (#2 Trigger)	White/Green (#2 Trigger)	45-55 Ω	45-55 Ω	0.5 V Minimum	-

NOTE: Some OEM Stators had Blue and Yellow wires instead of the Brown/Blue and Brown/Yellow wires.

NOTE: Some OEM Triggers had Orange and Green and Red and White/Green Wires.

NO SPARK OR INTERMITTENT SPARK ON ONE CYLINDER:

1. Check the Stator and Trigger resistance and DVA (see **NO SPARK ON ANY CYLINDER**).
2. If readings are good, disconnect stop wire from one of the Switchboxes. If the dead cylinder starts sparking, the problem is likely the blocking diode in the opposite Switchbox.
3. If #2 on a (3) cylinder engine is the one not sparking and the engine has a CDI Stator installed, disconnect the Blue wire going to the #2 Switchbox and see if the #2 cylinder starts sparking. If so, reconnect the Blue wire with the Blue wire going to the #1 Switchbox.

SWITCHBOX OR TRIGGER REPEATEDLY BLOWS ON SAME CYLINDER:

1. Check the Trigger wires for shorts to engine ground as a shorted Trigger wire can destroy a SCR inside the Switchbox.
2. In contrast, a shorted SCR inside the Switchbox can destroy a Trigger coil. Check the Trigger resistance and DVA (see **NO SPARK ON ANY CYLINDER**).
3. Replace the Ignition coil on the cylinder dropping spark.

NO SPARK ON TWO CYLINDERS:

1. If two cylinders from the same Switchbox will not spark, the problem is usually in the Stator. Test per above.
2. If the engine has a SIE Stator installed and #1 and #3 are the cylinders not sparking, disconnect the Yellow Stator wire from the #1 Switchbox and see if the #3 cylinder starts sparking. If so, replace the #1 Switchbox. If not, then reconnect the Yellow Stator wire to the #1 Switchbox and disconnect the Yellow Stator wire from the #2 Switchbox and see if the #1 cylinder starts sparking. If so, replace the #2 Switchbox.
3. If #2 and #4 are the ones not sparking, disconnect the Blue Stator wire from the #1 Switchbox and see if the #4 cylinder starts sparking. If so, replace the #1 Switchbox. If not, then reconnect the Blue Stator wire to the #1 Switchbox and disconnect the Blue Stator wire from the #2 Switchbox and see if the #2 cylinder starts sparking. If so, replace the #2 Switchbox.

WILL NOT STOP (KILL):

1. Disconnect all stop wires at the Switchbox. Connect a jumper wire to the (White or Black/Yellow) stop wire from the Switchbox and short it to engine ground. If this stops the Switchbox from sparking, the stop circuit has a fault. Check the key switch, harness, and shift switch. If this does not stop the Switchbox from sparking, replace the Switchbox. Repeat test as necessary for additional Switchboxes.

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Installation and Troubleshooting Guide

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COILS ONLY HAVE SPARK WITH SPARK PLUGS OUT:

1. Check for dragging starter or low battery causing slow cranking speed. DVA test Stator and Trigger.

MISS AT ANY RPM:

1. Disconnect the Rectifier from the Stator and retest. If the miss clears, replace the Rectifier.
2. In the water or on a Dynamometer, check the DVA from the Switchbox primary wires while connected to the Ignition coils. You should have a reading of at least 150 V or more, increasing with engine RPM until it reaches 300-400 V maximum. A sharp drop in DVA right before the miss becomes apparent on all cylinders will normally be caused by a bad Stator. A sharp drop in DVA on less than all cylinders will normally be the Switchbox or Trigger.
3. Connect an inductive tachometer to each cylinder in turn and try to isolate the problem. A high variance in RPM on one cylinder usually indicates a problem in the Switchbox or Ignition coil. Occasionally a Trigger will cause this same problem. Check the Trigger DVA (see **NO SPARK ON ANY CYLINDER**).
4. Perform a high-speed shutdown and read the spark plugs. Check for water. A crack in the block can cause a miss at high speed when the water pressure gets high, but a normal shutdown will mask the problem.
5. Check the Triggering and charge coil flywheel magnets for cracked, broken and loose magnets.

5 CYLINDER ENGINES:

NO SPARK ON ANY CYLINDER:

1. Disconnect the (White or Black/Yellow) stop wire AT THE SWITCHBOX.
2. Disconnect the Rectifier. If the engine now has spark, replace the Rectifier.
3. Check for broken or bare wires on the Switchboxes, Stator, and Trigger.
4. Check the Stator and Trigger resistance and DVA as follows:

Read from	Read to	OEM Ohms	SIE Ohms	DVA (Connected)	DVA (Disconnected)
Brown/Blue (Stator)	Brown/Yellow (Stator)	680-900 Ω	250-350 Ω	180-400 V	-
Brown/Blue (Stator)	Engine Gnd	Open	Open	-	Less than 2 V
Brown/Yellow (Stator)	Engine Gnd	Open	Open	-	Less than 2 V
White/Orange (#1,3,5 Triggers)	White/Yellow (Common)	45-55 Ω	45-55 Ω	0.5 V Minimum	-
White/Red (#2 & 4 Triggers)	White/Green (Common)	45-55 Ω	45-55 Ω	0.5 V Minimum	-

NOTE: Some OEM Stators had Blue and Yellow wires instead of the Brown/Blue and Brown/Yellow wires.

NOTE: Some OEM Triggers had Orange and Green and Red and White/Green Wires.

NOTE: The DVA reading to engine ground is checking a circuit inside the Switchbox. If the readings are not fairly equal, swap the Stator wires going to the Switchbox and recheck. If the low reading stays on the same wire from the Stator, replace the Stator. Otherwise, replace the Switchbox.

NO SPARK OR INTERMITTENT SPARK ON ONE CYLINDER:

1. If readings are good, disconnect stop wire from one Switchbox. If the dead cylinder starts sparking, the problem is likely the blocking diode in the Switchbox you disconnected.

SWITCHBOX OR TRIGGER REPEATEDLY BLOWS ON SAME CYLINDER:

1. Check the Trigger wires for shorts to engine ground because a shorted Trigger wire can destroy a SCR inside the Switchbox.
2. In contrast, a shorted SCR inside the Switchbox can destroy a Trigger coil. Check the Trigger resistance and DVA (see **NO SPARK ON ANY CYLINDER**).
3. Replace the Ignition coil on the cylinder dropping spark.

NO SPARK ON TWO OR THREE CYLINDERS:

1. If two cylinders from the same Switchbox will not spark, the problem is usually in the Stator.
2. Check the Stator and Trigger resistance and DVA as follows:

Read from	Read to	OEM Ohms	SIE Ohms	DVA (Connected)	DVA (Disconnected)
Brown/Blue (Stator)	Brown/Yellow (Stator)	680-900 Ω	250-350 Ω	180-400 V	-
Brown/Blue (Stator)	Engine Gnd	Open	Open	-	Less than 2 V
Brown/Yellow (Stator)	Engine Gnd	Open	Open	-	Less than 2 V
White/Orange (#1,3,5 Triggers)	White/Yellow (Common)	45-55 Ω	45-55 Ω	0.5 V Minimum	-
White/Red (#2 & 4 Triggers)	White/Green (Common)	45-55 Ω	45-55 Ω	0.5 V Minimum	-

NOTE: Some OEM Stators had Blue and Yellow wires instead of the Brown/Blue and Brown/Yellow wires.

NOTE: Some OEM Triggers had Orange and Green and Red and White/Green Wires.

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NOTE: The DVA reading to engine ground is checking a circuit inside the Switchbox. If the readings are not fairly equal, swap the Stator wires going to the Switchbox and recheck. If the low reading stays on the same wire from the Stator, replace the Stator. Otherwise, replace the Switchbox.

3. If the engine has a SIE Stator installed and If #1, #3 and #5 are the ones not sparking, disconnect the Yellow Stator wire from the #1 Switchbox and see if the #3 and #5 cylinders start sparking. If so, replace the #1 Switchbox. If not, then reconnect the Yellow Stator wire to the #1 Switchbox and disconnect the Yellow Stator wire from the #2 Switchbox and see if the #1 and #5 cylinders start sparking. If so, replace the #2 Switchbox. If not, then reconnect the Yellow Stator wire to the #2 Switchbox and disconnect the Yellow Stator wire from the #3 Switchbox and see if the #1 and #3 cylinders start sparking. If so, replace the #3 Switchbox.
4. If #2 and #4 are the ones not sparking, disconnect the Blue Stator wire from the #1 Switchbox and see if the #4 cylinder starts sparking. If so, replace the #1 Switchbox. If not, then reconnect the Blue Stator wire to the #1 Switchbox and disconnect the Blue Stator wire from the #2 Switchbox and see if the #2 cylinder starts sparking. If so, replace the #2 Switchbox.

WILL NOT STOP (KILL):

1. Disconnect all Black/Yellow stop wires at the Switchbox. Connect a jumper wire to the stop wire from the Switchbox and short it to engine ground. If this stops the Switchbox from sparking, the stop circuit has a fault. Check the key switch, harness, and shift switch. If this does not stop the Switchbox from sparking, replace the Switchbox. Repeat test as necessary for additional Switchboxes.

COILS ONLY HAVE SPARK WITH SPARK PLUGS OUT:

1. Check for dragging starter or low battery voltage causing slow cranking speed. DVA test Stator and Trigger.

MISS AT ANY RPM:

1. Disconnect the Rectifier from the Stator and retest. If the miss clears, replace the Rectifier.
2. In the water or on a Dynamometer, check the DVA from the Switchbox Primary wires while connected to the Ignition coils. You should have a reading of at least 150 V or more, increasing with engine RPM until it reaches 300-400 V maximum. A sharp drop in DVA right before the miss becomes apparent on all cylinders will normally be caused by a bad Stator. A sharp drop in DVA on less than all cylinders will normally be the Switchbox or Trigger.
3. Connect an inductive tachometer to each cylinder in turn and try to isolate the problem. A high variance in RPM on one cylinder usually indicates a problem in the Switchbox or Ignition coil. Occasionally a Trigger will cause this same problem. Check the Trigger DVA (see **NO SPARK ON ANY CYLINDER**).
4. Perform a high-speed shutdown and read the spark plugs. Check for water. A crack in the block can cause a miss at high speed when the water pressure gets high, but a normal shutdown will mask the problem.
5. Check the Triggering and charge coil flywheel magnets for cracked, broken and loose magnets.

BATTERY CHARGING ISSUES (ALL MODELS):

1. Regardless of whether the charging issue is overcharging or not charging at all, the #1 cause of all charging issues is the battery often due to improper style and/or charging neglect. #2 is the battery's connections. #3 is the Rectifier. #4 is the Stator.
2. The recommended type of battery for outboards is a single (NOT more than one) 850+ CCA dual purpose or cranking/starting **non-maintenance-free battery**.
3. Non-maintenance-free batteries (lead-acid flooded cell; has vent caps on its top) have heavy, thick plates. They're ideal for outboards, where batteries are commonly drained by accessories while fishing, etc. when there is no charge applied to a battery while the battery is in use. Its heavy plates can withstand constant discharging and charging. These batteries have much more reserve time and are much more suited for this behavior.

NOTE: Some Maintenance free batteries will have vented caps on top. When in doubt, change the battery to a non-maintenance free type.

4. Maintenance-free batteries should **NEVER** be used in an Outboard application. A new, fully charged maintenance-free battery may work fine at first but their life span is dramatically shortened due to the constant charging and discharging. This activity will cause the cells to become weak, and/or the cells will become dead. When this happens, the battery is unable to accept a full charge, thus putting the Rectifier at extreme risk of failure. Therefore, maintenance-free style batteries commonly cause charging issues shortly after installation.
5. Check all battery connections, particularly at engine ground. Make sure that all connections are tight and free of corrosion. Do **NOT** use wing nuts as they tend to loosen over a period of time from vibration. A loose connection **WILL** cause a premature battery and/or Rectifier failure(s).
6. If there is no change, try a single (**NOT** more than one) known good fully charged battery that is 850+ CAA Dual Purpose, or a cranking/starting battery that is non-maintenance free. Make sure the battery is a lead acid flooded cell battery (has vent caps on its top).

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7. Measure the DVA across the Stator's Green/Yellow battery charge wires, while connected to the Rectifier. At idle the DVA will normally be between 8-25 DVA. If not, disconnect the Green/Yellow wires from the Rectifier and retest. DVA will normally be 17-50 DVA at idle. If the voltage is low, the Stator is possibly faulty. Perform a visual of the Stator for browning and varnish dripping. These are signs that the Stator has overheated. If the visual inspection shows any of these signs, replace the Stator.

MAXIMUM OUTPUT TEST:

1. Install an ammeter capable of reading at least 9 Amps between the Red wire and the starter solenoid battery post.
2. Connect a load bank to the battery.
3. In the water or on a Dynamometer, start the engine and bring the RPM up to approximately 4500 RPM in gear.
4. Turn on the load bank switches to increase the battery load to equal 9 Amps.
5. Check the ammeter.
6. If the amperage is low,
 - a) Check the load bank connections and meter for battery draw.
 - b) If the output is still low, check and clean all connections between the battery and the Rectifier. Inspect Stator windings for burned or discolored windings.
7. If the amperage is correct, but the battery voltage remains low, replace the battery.

TACHOMETER TESTS

1. Measure the DVA across the Stator's Green/Yellow battery charge wires, while connected to the Rectifier. At idle the DVA will normally be between 8-25 DVA. If not, disconnect the Green/Yellow wires from the Rectifier and retest. DVA will normally be 17-50 DVA at idle. If the voltage is now within specification, the Rectifier is likely defective.
2. Disconnect the Rectifier's Gray wire. At 800-1,000 RPM, check the DVA on the Gray wire FROM THE RECTIFIER measured to engine ground. The reading should be 8 DVA or more. If not, replace the Regulator/Rectifier.
3. If at least 8 DVA, run a jumper wire from the Gray wire out of the harness to one of the Stator's Yellow wires.
4. If still no tachometer signal, try a known good tachometer.
5. If still no tachometer signal, replace the Stator.

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